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PRE-APPEAL BRIEF REQUEST FOR REVIEW

Docket Number (Optional)
AMD-E365

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on 06/05/2006

Signature Shannon Carmo

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Application Number	Filed
09/805,273	03/13/2001

First Named Inventor: YANG

Art Unit	Examiner
2823	ESTRADA, Michelle

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal.

The review is requested for the reason(s) stated on the attached sheet(s).
Note: No more than five (5) pages may be provided.

I am the

☐ applicant/inventor.

☐ assignee of record of the entire interest.
See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed.
(Form PTO/SB/96)

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Registration number 36,398

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Registration number if acting under 37 CFR 1.34 _____

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06/05/2006
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NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required.
Submit multiple forms if more than one signature is required, see below*.

☒ *Total of 1 forms are submitted.

REMARKS ACCOMPANYING PRE-APPEAL BRIEF REQUEST FOR REVIEW

In response to the final Office Action dated March 7, 2006, Applicants respectfully request a review of the final rejection in the above-identified application. Applicants respectfully submit that the Examiner's rejections of the Claims are improper as essential elements needed for a proper prima facie rejection are missing (e.g., (1) the teaching of all of the recited claim limitations and (2) the references, when considered as a whole, do not suggest the desirability and thus the obviousness of making the combination). Claims 35 and 38 are rejected under 35 USC 103(a) as being unpatentable over Kunikiyo in view of Mui in further view of Applicant's Admitted Prior Art (hereinafter "AAPA"). Claims 37 and 40-43 are rejected under 35 USC 103(a) as being unpatentable over Kunikiyo in view of Mui in further view of AAPA in further view of Examiner's comments.

KEY CLAIM LIMITATIONS NOT MET BY THE CITED REFERENCES

Kunikiyo, Mui, and AAPA, alone or in combination, do not teach or suggest a conductive adhesive layer having a thickness greater than 10 and less than or equal to 100 angstroms (Claim 35); a conductive adhesive layer having a minimum thickness required to provide adhesion between a substrate and a conductive layer for a robust structure that can withstand subsequent processing (Claim 35); an etchant comprising chlorine and oxygen (Claim 35); etching conducted at a pressure between 2 mTorr and 4 mTorr (Claim 35); a conductive layer and a conductive adhesive layer having a combined thickness of approximately 3000 angstroms or less (Claim 37); and an oxygen flow rate of approximately 4 to 12 sccm (Claim 41).

THICKNESS OF CONDUCTIVE ADHESIVE LAYER AND ITS COMBINED THICKNESS WITH THE CONDUCTIVE LAYER

Claim 35 recites that the conductive adhesive layer has a thickness that is greater than 10 and less than or equal to 100 angstroms. Examiner has cited Kunikiyo as teaching that a conductive adhesive layer (polysilicon sidewalls 5) has a thickness of between 50 and 300 angstroms. Final Office Action, page 2, paragraph 4. Applicant is unsure as to where Kunikiyo teaches these numbers. In fact, Applicant submits that Kunikiyo explicitly contradicts Examiner's assertion. Based on Figure 2 of Kunikiyo, Applicant submits the polysilicon sidewalls 5 of Kunikiyo have the ***same thickness*** as its insulating film 3, which Kunikiyo states has a thickness of about 100 nm (***1000 angstroms***). Kunikiyo, col. 10, lines 61-62. As such, Applicant submits that not only does Kunikiyo fail to teach a thickness of greater than 10 and less than or equal to 100 angstroms, it explicitly teaches away from this by teaching that the insulating film 3, and hence polysilicon sidewalls 5, have a thickness of 1000 angstroms. Therefore, Applicant submits that Kunikiyo, Mui, and AAPA, alone or in combination, fail to teach our suggest that the conductive adhesive layer has a thickness that is greater than 10 and less than or equal to 100 angstroms.

Claim 35 also recites that said conductive adhesive layer has a minimum thickness required to provide adhesion between said substrate and said conductive layer for a robust structure that can withstand subsequent processing. As far as Applicant can tell, Examiner appears to assert that this limitation is equivalent to Mui's statement that "the thickness of the polysilicon later 16 would depend upon the end use of the semiconductor which is to contain the polysilicon layer 16." Applicant submits that the statements are ***not*** one and the same. For example, this limitation as recited in Claim 35 is concerned with ***withstanding subsequent processing***, whereas the cited portion of Mui is concerned with the ***end use*** of the semiconductor. Therefore, Applicant submits that Kunikiyo, Mui, and AAPA, alone or in combination, fail to teach our suggest that the conductive adhesive layer has a thickness

required to provide adhesion between said substrate and said conductive layer for a robust structure that can withstand subsequent processing.

Claim 37 recites that the conductive layer and the conductive adhesive layer have a combined thickness of approximately 3000 angstroms or less. Examiner attempts to show that this limitation is taught by making the generalized statement: "this would depend on the thickness chosen for the polysilicon layer and the conductive later." Applicant submits that the statement achieves nothing more than simply stating the obvious (e.g., that the whole equals the sum of its parts). Examiner has done nothing to show that the Mui reference, or any other reference for that matter, teaches or suggests that the conductive layer and the conductive adhesive layer have a combined thickness of approximately 3000 angstroms or less. Therefore, Applicant submits that Kunikiyo, Mui, and AAPA, alone or in combination, fail to teach or suggest that the conductive layer and the conductive adhesive layer have a combined thickness of approximately 3000 angstroms or less.

ETCHANT COMPRISING OXYGEN AND THE FLOW RATE THEREOF

Claim the 35 recites an etchant comprising oxygen. Examiner has cited Mui as teaching this limitation. Notwithstanding Mui's use of oxygen in "another preferred embodiment" (Mui, col. 9, lines 8-11), when viewed ***as a whole***, Mui ***strongly discourages*** the use of oxygen in the etchant and effectively ***teaches away*** from its use. Applicant notes that the "more preferred etchant gas" of Mui does not include oxygen. Mui, col. 9, lines 26-32. Furthermore, in the Experimental Examples provided by Mui, Applicant notes that the examples in which oxygen was used (Examples II, IV, and VI) all experienced undesirable effects such as micro-trenching and lack of control over the polysilicon profile, whereas the examples in which oxygen was not used (Examples I, III, and V) all experienced the desired results of smooth profiles and the absence of micro-trenches. As such, Applicant submits that an individual of ordinary skill in the art at the time of the invention, armed with the Mui

reference, and without the hindsight benefit of the present application, would be motivated to ***avoid using oxygen*** as a component of the etchant because of the undesirable effects that it produces. Indeed, Mui admits that the use of oxygen in etching results in a bowed profile and that replacing oxygen with CO lowers the gate oxide erosion. Mui, col. 1, lines 42-45; col. 18, lines 57-58. As such, Applicant submits that Mui and in fact ***teaches away*** from an etchant comprising oxygen.

Claim 41 recites that the flow rate of the oxygen is approximately 4 to 12 sccm. Examiner cites that Mui discloses a flow rate of oxygen of 4 to 70 sccm. First, Applicant reiterates that Mui discourages and effectively teaches away from using oxygen in etching. Secondly, Applicant has reviewed the Mui reference thoroughly and asserts that such a limitation cannot be found therein. Applicant notes that Tables I, II, and III each show a preferred gas flow of 4 to 70 sccm for ***CO*** and ***nitrogen***, but list ***no such specification for oxygen***. Applicant submits that Kunikiyo and AAPA, alone or in combination, fail to remedy this shortcoming of Mui. As such, Applicant submits that Kunikiyo, Mui, and AAPA, alone or in combination, fail to teach or suggest this limitation.

ETCHING PRESSURE

Claim 35 recites that the etching is conducted at a pressure of between 2 mTorr and 4 mTorr. Examiner cites the first table of column 12 of Mui as teaching an etching pressure of 0.5 to 50 mTorr. First, Applicant reiterates that Mui discourages and effectively teaches away from using oxygen in etching, and consequently also teaches away from using an etch pressure between 2 and 4 mTorr ***while using oxygen with chlorine***, as recited in Claim 35. Secondly, to the extent that Mui may teach a broad pressure range of 0.5 to 50 mTorr, Applicant submits that Mui also teaches an ***optimum pressure range*** of 7 to 10 mTorr. Therefore, as one of ordinary skill in the art would presumably desire to achieve optimum results, one would only be motivated to use an etching pressure within the range of 7 to 10

mTorr, and thus avoiding the claimed range of 2 to 4 mTorr entirely. Thus, Applicant submits that Mui effectively teaches away from using an etching pressure in the range of 2 to 4 mTorr to achieve optimum results. Furthermore, Applicant submits that motivation of one of skill in the art to use an etching pressure in the range of 2 to 4 mTorr would not exist but for the hindsight benefit of the present application.

CONCLUSION

In summary, Applicants respectfully submit that the Examiner's rejections of the Claims are improper as key limitations needed for proper prima facie rejections of Applicants' Claims are not met by the cited references as outlined above. Additionally, Applicants respectfully submit that the Examiner's rejections of the claims are improper as Examiner has failed to demonstrate sufficient motivation to combine the cited references.

Because key limitations of independent Claim 35 (from which Claim 38 depends) are not met by Kunikiyo, Mui, and AAPA, alone or in combination, Applicants respectfully submit that the rejection of Claims 35 and 38 under 35 USC 103(a) as being unpatentable over Kunikiyo in view of Mui in further view of AAPA is improper and should be reversed. Additionally, because key limitations of Claim 37 and 41 (which depend from Claim 35) are not met by Kunikiyo, Mui, AAPA, and Examiner's comments, alone or in combination, the rejection of Claims 37 and 41 under 35 USC 103(a) as being unpatentable over Kunikiyo in view of Mui in further view of AAPA in further review of Examiner's comments is improper and should be reversed. Finally, Applicant submits that Examiner's comments do not remedy the shortcomings of Kunikiyo, Mui, and AAPA, and therefore the rejections of Claims and 40, 42, and 43 under 35 USC 103(a) as being unpatentable over Kunikiyo in view of Mui in further view of AAPA in further review of Examiner's comments are improper and should be reversed.